

# WORKPLAN

## LONG ISLAND SOUND

### DREDGED MATERIAL MANAGEMENT STUDY

### ENVIRONMENTAL IMPACT STATEMENT

January 2000

1. PURPOSE: The purpose of this work plan is to outline the tasks for the preparation of an Environmental Impact Statement (EIS) which will consider the potential designation of one or more dredged material disposal sites in the waters of Long Island Sound, under Section 102© of the Marine Protection, Research and Sanctuaries Act (MPRSA) and 40 CFR 230.80 of the regulations of the Environmental Protection Agency (EPA) under Section 404 of the Clean Water Act. The EIS will be prepared in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500 et. seq.), and the EPA/Corps site designation handbook.

2. SUMMARY: Dredged material has been disposed of at the existing sites known as the Western Long Island Sound, the Central Long Island Sound, the Cornfield Shoals and the New London Disposal Sites pursuant to programmatic and site designation EIS's released by the Corps of Engineers in 1982 and 1991. This activity has been regulated in different ways at different times depending on the status of applicable law and policy. EPA and the Corps have identified a likely need to continue the marine disposal of dredged material in the Long Island Sound area. Accordingly, the EIS will provide an evaluation of the existing sites, as well as additional alternatives including other open water disposal sites, other types of dredged material disposal and management, and the no action alternative. The EIS will support EPA's final decision on whether one or more dredged material disposal sites will be designated under the MPRSA and identified in advance under the Clean Water Act (40 CFR 230.80). The EIS will include analyses applying the five general and eleven specific site selection criteria for designating ocean disposal sites presented in 40 CFR Parts 228.5 and 228.6 and the Section 404(b)(1) guidelines. In addition, the impact criteria in 40 CFR 228.10 will be used to assess impacts of the existing sites.

3. DESCRIPTION OF WORK AND SERVICES: The contractor will use background information and data as compiled during the Phase 1 and Phase 2 study efforts, and any additional data collection and analyses performed as outlined in the tasks and subject areas below, to address the impacts of dredged material disposal at alternative dredged material disposal sites in the Long Island Sound region. The format of the EIS is shown on Attachment #1.

### **TASK #1: PUBLIC INVOLVEMENT PLAN**

The contractor shall prepare a public involvement plan for the EIS. This plan will explain the NEPA and EIS process, discuss the proposed action, outline the activities that have been conducted to date (either by efforts previously accomplished by contractor, the Corps or EPA) and outline future public involvement activities. A summary of the NEPA and the EIS process are available from the various presentations and guidance documents available through EPA and the Corps, and the proposed action is stated in the Notice of Intent, as published in the Federal Register on June 3, 1999.

The public involvement activities have begun on this EIS. Items that have occurred are the three public scoping meetings held in June 1999 in Stony Brook, New York, and Groton and Stamford, Connecticut. A report titled "*Long Island Sound Site Designation, Environmental Impact Statement: Summary of Scoping Meetings*" provides an overview of the comments and issues presented at the meetings. The primary issues of concern raised at the 1999 public scoping meetings were grouped into four different categories

(Regulatory and Public Involvement, Natural Environment, Socioeconomic Issues and Other Issues) and within the categories there were 36 issue headings. This document provides a summary of the public scoping meetings.

Public workshops were also held in Port Jefferson, New York and Stratford, Connecticut in October 1999. Four fact sheets were produced on the four topic areas of Dredging Needs and Alternatives, Data Review and Recommendations, Site Screening Process, and Evaluation Factors. These topics were the focus of small group discussions to get public input on these issues.

In the winter of 2000, there will be public workshops on the geographical area to be studied, the evaluation factors and any field work results.

The EIS shall include a table referencing the appropriate section(s) in the EIS that addresses the comments from the scoping meetings and any follow-up workshops.

The contractor will prepare a Public Involvement Plan (PIP) that will outline and incorporate the above activities and outline future activities. In this plan the contractor will identify work products to be reviewed by the public, methods of public input, and a timeline that will illustrate the elements of the PIP. The PIP will ensure that populations identified in Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", and Executive Order 13045 "Protection of Children from Environmental Health Risks and Safety Risks" are notified and involved. Possible future public involvement may include (but not limited to) evaluation factors, site screening process, site selection, data collection, and results of field sampling. The methods to involve the public may include (but not limited to) mailings of notices, fact sheets, workshops, public meetings and other activities. Future activities are to be integrated throughout, and will be determined through discussions with the Corps and EPA.

A section devoted to public involvement will be included in the EIS. This section will be a summary of the public involvement activities accomplished since the development of the April 1998 Letter of Agreement between the Corps of Engineers and EPA.

All work products of the public involvement program (fact sheets, notices, summaries, etc.) are to be provided in a "Public Participation" Appendix to the EIS.

## **TASK #2: DREDGING NEEDS INVENTORY**

The Corps and EPA are presently compiling data on historic dredging and disposal activities in Long Island Sound. The data will cover Federal civil works dredging projects since 1870, and permit activities by other Federal entities, state and municipal projects, and private activities, since about 1980. The contractor will use this data, together with data from other sources identified during the completed literature review, and information compiled from its survey and inventory of marine access dependant facilities (see Attachment #2, (E)1.) to prepare a dredging needs assessment.

The dredging needs assessment will project the anticipated dredging volumes from each harbor in Connecticut, New York and Rhode Island, within the coastal economic study zone, defined as the harbors tributary to the East River, NY on the west, and the Pawcatuck River and Little Narragansett Bay, CT and RI on the east, and including the

harbors of Long Island located on Long Island Sound, Gardiners Bay, Peconic Bay and Block Island Sound. The projections will cover the 20-year period beginning with publication of the Final EIS and Final Rulemaking. Assumptions will be made as to the anticipated quality of the material (suitability for unconfined open-water disposal under MPRSA criteria).

Historic dredging volumes by harbor, and by source type (Federal civil works, other Federal, state and municipal, and private) will be discussed and displayed in tables, in bar graphs, and using pie diagrams on a map of the LIS area. Projected dredging volumes over the 20-year period will be similarly discussed and displayed.

The dredging needs assessment, including detailed narrative, full tables and complete graphics will be included in a "Dredging Needs" Appendix to the EIS. A summary of the dredging needs assessment, including representative tables and graphics will be included in the EIS main report in the Purpose and Need section.

### **TASK #3: ALTERNATIVES**

The site screening process carried out for the development of alternatives will be described, as determined through input and coordination with agencies and the public at the formal scoping sessions, workshops, meetings, etc. held throughout the EIS process. The methods and results of disposal site evaluations based on the screening criteria will be summarized in the Alternatives section. The site screening process and site screening criteria will be provided in detail in a "Site Screening Process" Appendix.

The EIS will consider at a minimum various alternatives (depending on results of site screening process) including: the no action alternative (i.e., no designation of any sites), designation of one or more of the existing open water sites, designation of alternative open water sites identified within the study area that may offer environmental advantages to the existing sites, and identification of other disposal and/or management options, either in or out of the water. Those alternatives not considered reasonable or feasible will also be described, with reasons stated as to why they were not considered for further evaluation.

This section will discuss and contrast alternative disposal sites and methods. Examples that will be considered during the site selection process could include containment islands, nearshore sites, borrow pits, confined aquatic disposal sites, and beneficial use of the material. Also included in the evaluation will be alternative dredged material treatment technologies for contaminated materials. A detailed evaluation using the evaluation factors provided by the Corps and EPA, and a matrix for comparing the benefits, impacts and costs of various reasonable alternatives will be provided. Aquatic disposal sites will be evaluated based on the level of impacts to water quality and designated and existing uses, special aquatic sites, fish and fishing, marine and estuarine benthic habitat, threatened and endangered species, other wildlife, historic and archaeological resources, recreation, as well as cost, engineering and economic feasibility. The cost evaluation will measure and describe the cost of various disposal alternatives for the several classes and types of projects that would use those methods, including: large federal projects, small federal projects, and permit activities of various sizes. Open water alternatives shall be evaluated using the MRRSA site selection criteria (228.5 and 228.6). Upland disposal sites and dewatering areas will be evaluated based on the level of impacts to surface and ground water quality, State and Federal

wetlands, land use and parks, air quality, threatened and endangered species, fish and wildlife habitat, historic and archaeological resources, and traffic, as well as cost and engineering and economic feasibility. Upland and aquatic sites will be evaluated pursuant to and in accordance with the Clean Water Act, Section 404(b)(1) guidelines.

In Section 6.0 of the EIS, the contractor shall compare each alternative site or technology within the four general alternative categories, i.e., open water, upland, beneficial use/habitat development and treatment technologies. Based on the environmental and socioeconomic effects evaluation in the Environmental Consequences Section, and the engineering and economic feasibility analysis in the Alternatives Section, each alternative site/technology will be ranked within each category. The discussion should reflect and reference those analyses, and explain why certain sites were ranked higher than other sites. The EIS should not recommend a particular alternative, but note the highest ranking for each general disposal site category.

The Environmental Protection Agency's preferred alternative will be presented in the Final EIS after public review of the Draft EIS. This will be the dredged material disposal alternative(s) which are determined to be environmentally best suited to receive dredged material, in accordance with the MPRSA and the Clean Water Act. The economic component will be considered in the evaluation, but the alternative(s) will be determined as those best suited to receive dredged material based on environmental review. Any preferred alternative will be evaluated for consistency with all applicable state coastal zone management policies in accordance with the Coastal Zone Management Act.

The Alternatives section will present mitigation measures and methods to avoid or minimize any potential adverse effects of disposal, including incremental costs. Monitoring plans will also be discussed, referencing the Site Monitoring Management Plan (SMMP) discussed later in this Work Plan.

#### **TASK #4 AFFECTED ENVIRONMENT**

The EIS will succinctly describe, in language understandable to the general public, the biological, physical, chemical, socioeconomic and cultural environment of the disposal alternatives under consideration. A description of the resources to be included in the Affected Environment section, as well as direction on how these resources are to be addressed, are included in Attachment #2. Existing data sources will be used to establish baseline conditions, as well as additional information gathered through field investigations. GIS data will also be used to portray existing environmental conditions, and for the alternative site screening process to be carried out in coordination with federal and state agencies. GIS data will be illustrated in the EIS for the appropriate resources.

As outlined in Attachment #1, a general section will be included in the EIS that describes the setting for the entire study area, i.e., "the Sound proper," and shall include discussions of the topics bulleted below. Subsequent similar sections will then describe the site-specific setting for each alternative disposal site following the guidelines specified at the end of this task and Attachment #2. The Affected Environment section will also identify and treat explicitly the information used in the MPRSA site selection criteria so that the reader can easily assess each criteria in the appropriate text. The specific criteria citations are noted on Attachment #1.

The General Long Island Sound Setting shall include a detailed description of the following:

Physical Setting

- C Water quality. Describe the pollution gradient in the Sound in terms of sources/loads of pollutants and flushing rates. Describe the water quality classification of the Sound and what water quality standards (CT and NY) are being met or not met and why. Describe the incidence of hypoxia and the current thinking on why it occurs and what is being done about it under the NEP. Describe the trends and gradients in contaminants in the water column
- C Geology. Describe the general bathymetry, geological and sedimentary history of the Sound and mix of sediment types in the overall study area, including the large scale gradients in sediment grain size and chemistry
- C Meteorology. Describe the major seasonal weather patterns that affect the Sound as they relate to temperature, precipitation and storm activity.
- C Physical Oceanography. Describe the stratification and water mass dynamics relative to the temperature/salinity regime, the large scale tidal currents and seasonal current patterns for non-tidal currents and waves. Review the historical oceanographic (Yale Bingham Oceanographic Collection) and more current (NOAA/USGS/Stony Brook) data to characterize the general patterns. Use LISS model printouts to exhibit patterns. Also describe how the three basins in the Sound are similar and different and discuss flushing rates for each. Discuss sediment transport issues relative to erosion/sedimentation processes with existing USGS models/maps, referencing the geological discussions above.

C Biological Resources

- C Plankton. Describe the seasonal patterns and distribution of phytoplankton and zooplankton (holoplankton and meroplankton) in the Sound. Discuss species dominance patterns and how they relate to environmental conditions (temperature, salinity, light and nutrients. Discuss any incidences of nuisance or toxic blooms in the sound and their impact on resources and uses.
- C Benthos. Discuss the general community types that have described in the sound in terms spatial distribution in the three basins and their seasonality. Provide a comprehensive list of species found in those community types. Describe how they relate to sediment type and reflect environmental conditions.

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- C Fish and Shellfish Resources. Describe the Sound's species of fish and shellfish in terms of general spatial and seasonal distribution. Generate seasonal distribution map for the most common species noting any known spawning, nursery and migration areas utilizing the applicable state fisheries data and any other pertinent studies or data sets. Discuss the various abundance patterns (catch and biomass) over regions of the Sound. Generate a comprehensive list of species and a life history table with pertinent information such as spawning habitat and time period, food habits, seasonal migratory activities and population status in the Sound. The species that are covered under the Essential Fish Habitat shall be identified and included in the life history table.

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- C Wildlife Resources. Describe birds, reptiles and mammals found in the sound relative to their seasonality and spatial distribution. Again, generate a similar comprehensive species list and a life history table.
- C Endangered and Threatened Species. All federally listed endangered or threatened species shall be identified and discussed relative to their distribution, seasonality and current status, based on information provided by NMFS and USFWS. State endangered or rare species will also be listed based on information provided by the respective states' Natural Heritage Programs. Life History Tables shall be developed for these species.

#### Socio-economic Resources

- C General Fishing Activities. Describe commercial and recreation species caught, general areas and seasons of fishing activities, practices, catches (trends) and economic value to region.
- C Shipping/Navigation. Describe major port areas, commodities and importance of commercial shipping to the local and regional economies. Describe the range of recreational boating and associated industries that exist in the Sound and its impact to the local and regional economies.
- C Beaches. Describe the public beaches throughout the sound, their location and importance to users and the local economy. Generate a map of public beaches in both states. Generate table reviewing major beaches and summarizing what is known about closures relative to local pollution inputs to the region.
- C Parks/Natural areas. Map and tabulate Federal, state and local parks near all shorelines of the sound. Briefly describe what sensitive resources occur in these areas in the Table.
- C Historical/Archaeological Resources. Describe general resources in Sound. Review State Historical records, NOAA charts and Side Scan Sonar to generally describe types of resources in the Sound.
- C Other human uses (swimming, recreational diving, cable/pipeline locations, military, mining activities). Describe in general other uses of the Sound. Locate important areas on map.

For the existing and alternative open water site descriptions, the discussion will be specific to each candidate disposal site. The contractor shall review (1) DAMOS data, (2) data generated from the literature review and (3) the EIS site specific studies to fully describe the existing environmental conditions at each site. This includes, but is not limited to the following: water quality, sediment quality, side scan, bathymetry, current speed/direction, benthos, fish/shellfish and fishing activities, other human uses (cable/pipeline areas, military, mining) and potential for historic shipwrecks. The contractor shall describe the range of chemical conditions at each site as influenced by past disposal practices, including sediment chemistry, toxicity and bioaccumulation by comparing the samples from historic

mounds (worse case) and active mounds (typical of recent disposal) with reference areas. Offsite samples can be used to characterize offsite impacts. Other available data should be included as appropriate. If appropriate (e.g. plankton), the site specific section should reference the previous discussions under the general setting to avoid unnecessary repetition and/or if no site specific information is available. See the description in Attachment #2 for further guidance.

The descriptions of the Affected Environment for the upland/beneficial use alternatives shall follow the format shown in Attachment #1. As with open water sites, a general section shall precede the descriptions of each site. The contractor will provide a general description of land uses along the shorelines of Long Island Sound. A description will be included of land uses surrounding any upland disposal site alternatives or beneficial use sites, including zoning designations. This will be supported by available land use mapping which is to be obtained from regional, state or local planning agencies, with appropriate colored graphics illustrating the various land use types.

## **TASK #5 ENVIRONMENTAL CONSEQUENCES**

An outline of this section is provided in Attachment #1. As with the "Affected Environment Section" described above, the "Environmental Consequences" section of the EIS will describe general impacts of the type of disposal alternatives (open water, upland, beneficial use) followed by a description of impacts associated with the specific alternative site. In the general impacts discussion, disposal processes will be described, as well as impacts that are common to all open water, upland and beneficial use disposal alternatives.

The impact discussions should be highly analytical, incorporating a comprehensive, in-depth review of applicable and pertinent literature and data collected by DAMOS and the field efforts associated with this study. They shall include direct, secondary and cumulative impact determinations as required by NEPA.

The contractor shall perform a thorough and rigorous review of the scientific literature, expanding to studies outside the region, if applicable. Site specific determinations should address the site evaluation criteria that are adopted from the evaluation factors presented at the October 1999 workshops. In particular, the discussion of impacts of open water alternatives should address questions based on site selection (228.5 and 228.6) and impact criteria (228.10) in the MPRSA. These questions are provided in Attachment #3. Any applicable models shall be used to provide a quantitative assessment of impacts as much as possible, using a range of assumptions and conditions to characterize the anticipated range of effects.

Guidance for preparation of the general impact discussions as related to the MPRSA site selection criteria, and 404(b) guidelines, for open water disposal, upland disposal, and beneficial use/habitat development is provided below. Guidance for impact analyses for each alternative (open water, upland disposal, and beneficial use/habitat development sites) as related to the MPRSA site selection criteria, 404(b) guidelines, and other resource topics, is provided in Attachment #2.

### **General Impacts of Open Water Disposal**

With the assumption that projects slated for disposal meet the Ocean Dumping criteria (Green Book) and Section 404 (b)(1) guidelines (Inland Testing Manual), the discussion of the general impacts of open water disposal should include (but is not limited to) a detailed impact discussion on the areas listed below:

- C Disposal process in open water. Describe in detail the formation and consolidation process of mounds from the work of WES and others related to the MDFATE model development.
- C Impacts to water column impacts relative to suspended solids and the release of sediment contaminants. Review the literature on plume studies of dredged material in detail, describing the amount and size fraction of the sediments remaining in the water column.
- C Changes in the sediment environment. Describe the changes in sediment type (grain size) and likely chemical loading based on the range of projects likely to use the site (Dredging Needs effort) that would meet the above-cited testing criteria).
- C Burial of the benthic epi-and infaunal invertebrates and fish (vulnerable life stages). Describe typical forms and how tolerant they are to direct burial. Describe in detail the recolonization process (a la Rhoads and Young). Review the literature to describe potential for bioaccumulation of sediment contaminants and impact of bioaccumulation to benthic organisms. Identify finfish lifestages (e.g. egg, or limited mobility or refuge seeking juveniles) or slow moving demersal lifestyle may also be impacted from direct burial)
- C Effects of suspended solids on filter-feeders invertebrates, lobster and fish. Review the literature habitat (re: burrows) and food source (benthic invertebrates). Review the literature to describe potential for bioaccumulation and impacts to marine resources and human health.
- C Effects on marine wildlife. Changes in habitat and food sources. Review the literature to describe potential for bioaccumulation and impacts to these resources.
- C Effects on Endangered and Threatened Species. Same as wildlife.
- C *General impacts of Upland Disposal*

The contractor shall provide a detailed summary of potential impacts to land use and resources that broadly apply to typical upland sites, or, discuss a range of site conditions. The impacts of upland disposal and/or the creation of beneficial use sites on surrounding land uses, zoning, riparian rights, and water access will be presented. The contractor shall review the existing literature (including the many WES documents on the subject), liberally citing examples of impacts noted on example sites. The general impact issues discussed in the October 1999 Workshop Fact Sheet shall be addressed to the extent possible, as related to a general project. Available landfills and brownfields shall be reviewed as potential upland disposal alternatives. Loss of landfill space will be evaluated for any landfill disposal options. The secondary and indirect impacts of port development will be considered for any port development beneficial use options as well.

The contractor shall describe a range of dredges that are used, typical logistical considerations, dewatering

needs, transportation and handling costs, and tipping fees (describe range in local landfills).

C **General impacts of Beneficial Use/Habitat Development Sites**

The contractor shall provide a detailed summary of potential impacts to land use and resources that broadly apply to typical beneficial use or habitat development sites, or discuss a range of site conditions. The contractor shall review the existing literature (including the many WES documents on the subject, liberally citing examples of impacts noted on example sites.

The contractor shall describe the range of dredges used, typical logistical considerations, de-watering needs, transportation and handling costs, environmental goals and constraints. As a separate category of impacts, the contractor shall also describe all impacts associated with the implementation of the treatment technologies.

As indicated above and in Attachment #1, this subsection is to be followed by a site by site assessment of impacts of the site resources identified in Task 4.

**TASK #6: COMPLIANCE/CONSISTENCY WITH ENVIRONMENTAL LAWS, REGULATIONS AND PROGRAMS**

The Contractor will provide a section in the EIS regarding compliance and consistency of the preferred dredged material disposal alternative with appropriate federal, state and local environmental laws, regulations and programs. This includes the following:

- C Clean Water Act, Section 404(b)(1) guidelines
- C MPRSA site selection criteria
- C Coastal Zone Management Act (for Connecticut, New York and Rhode Island, if applicable)
- C Endangered Species Act
- C Magnuson-Stevens Fishery Conservation and Management Act
- C National Historic Preservation Act
- C Fish and Wildlife Coordination Act
- C Marine Mammal Protection Act
- C Clean Air Act
- C Appropriate Federal Executive Orders and Memorandums

Also, consistency will be assessed with any appropriate state or regional comprehensive conservation and management plans.

**TASK #7: PREPARATION OF THE DRAFT AND FINAL EIS AND DEVELOPMENT OF DRAFT AND FINAL SITE MONITORING/MANAGEMENT PLANS (SMMP)**

(A) The contractor shall prepare a Preliminary Draft EIS for review by the Corps and EPA. The contractor shall review and organize comments received, and consult with NAE and EPA on the appropriate revisions to be made to the document. The contractor shall then prepare a Draft EIS for public release.

(B) The contractor shall review, organize and categorize public comments on the Draft EIS and prepare draft responses to all comments except those that deal with policy matters for the EPA and the Corps. These will be identified by the agencies before the task will begin. Technical agency and contractor staff shall determine what changes will be made to the document for the preparation of a Final EIS based on the comments. The contractor shall prepare a Preliminary Final EIS for review by the Corps and EPA. The document will be revised accordingly in consultation with the Corps and EPA. The contractor shall then prepare a Final EIS for distribution.

(C) For each of the open water sites to be designated, the contractor shall prepare a SMMP as required under Sections 102 (c )(3) of the MPRSA. All the requirements in this plan as described in the statutory language ((c)(3)A-F) must be comprehensively addressed and integrated with the DAMOS program. The contractor shall prepare a SMMP as a stand alone document, but incorporate the findings and evaluations in the EIS as much as possible. Example SMMPs will be provided. Draft and Final versions of the SMMP will be prepared.

## **ATTACHMENT #1**

C

### **EIS Format**

**EXECUTIVE SUMMARY:** An Executive Summary (10-15 pages) will be provided which will provide an overview of the analysis and findings of the EIS.

#### **1.0 Introduction**

The legislative history of the Clean Water Act and Ocean Dumping Act application to dredged material disposal in Long Island Sound, with reference to historic and current disposal and DAMOS monitoring activities will be summarized.

#### **2.0 Purpose and Need**

This section will briefly specify the underlying purpose and need for dredging of the ports of southern New England and Long Island and for identifying and maintaining environmentally sound and cost effective dredged material disposal options for the Long Island Sound region. This section will also provide a background regarding the National Environmental Policy Act process and its requirements. A summary of the public involvement process carried out for the EIS will be provided. A description of the existing Federal civil works navigation projects in the Long Island Sound area will be included, as well as a summary of non-Federal dredging projects (See Task #2).

#### **3.0 Alternatives, including the Preferred Selected Disposal Site(s)**

See Task #3

#### **4.0 Affected Environment (See Task #4)**

4.1 Location (40 CFR 228.6 (a)(1)) The geographic setting and extent of the study area will be described, as well as general land use around the Sound. The Sound will be described as the western, central and eastern basins.

##### 4.2 History of Dredged Material Disposal in the Study Area

A brief description will be provided of the disposal history at the four existing sites and other historic sites. This section will also explain the discontinued disposal sites depicted on LIS nautical charts. The text should also include a brief description of how the study areas were selected for each disposal site to be evaluated.

##### 4.3 Long Island Sound General Setting

###### 4.3.1 Natural Resources

4.3.1.1 Water Quality (228.6(a)(4); 228.6(a)(9)

4.3.1.2 Geology (228.6(a)(1)

4.3.1.3 Meteorology (228.6(a)(6)

4.3.1.4 Physical Oceanography (228.6(a)(1) and (a)(6)

4.3.1.5 Biota (228.6(a)(2); 228.6(a)(9); 228.6.10(b)(2);  
228.10(b)(3); 228.10(b)(5))

- 4.3.1.5.1 Plankton
- 4.3.1.5.2 Benthos
- 4.3.1.5.3 Fish and Shellfish Resources
- 4.3.1.5.4 Wildlife Resources
- 4.3.1.5.5 Endangered and Threatened Species

- 4.3.2 Socioeconomic Resources
  - 4.3.2.1 Fishing Activities (228.56(a) and (b) 228.6(a)(8))
  - 4.3.2.2 Shipping/Navigation (228.5(a) and (b); 228.6(a)(8))
  - 4.3.2.3 Beaches (228.5(b); 228.6(a)(3))
  - 4.3.2.4 Parks/Natural Areas (228.5(b); 228.6(a)(3))
  - 4.3.2.5 Historic/Archaeological Resources (228.6(a)(11))
  - 4.3.2.6 Other human uses (swimming, recreational diving, cable/pipeline locations, military, mining activities) (228.6(a)(8))

#### 4.4 Existing and Alternative Open Water Sites

- 4.4.1 Site A (Open Water)
  - 4.4.1.1 Location/bathymetry
  - 4.4.1.2 Water Quality
  - 4.4.1.3 Sediment
  - 4.4.1.4 Physical Oceanography
  - 4.4.1.5 Biota
    - 4.4.1.5.1 Plankton
    - 4.4.1.5.2 Benthos
    - 4.4.1.5.3 Fish/Shellfish
    - 4.4.1.5.4 Wildlife
    - 4.4.1.5.5 Endangered Species
  - 4.4.1.6 Fishing Activities
  - 4.4.1.7 Shipping/Navigation
  - 4.4.1.8 Beaches
  - 4.4.1.9 Parks/Natural Areas
  - 4.4.1.10 Historic/Archaeological
  - 4.4.1.11 Other Human Uses
- 4.4.2 Site B (Open Water)
  - (same as above)
  - etc.

#### 4.5 Upland Alternatives

- 4.5.1 General Land Use Setting
- 4.5.2 Description of range of sites considered
- 4.5.3 Site A
  - 4.5.3.1 Location, general setting and land uses
  - 4.5.3.2 Soils/Vegetation

- 4.5.3.3 Water Resources
  - 4.5.3.3.1 Surface
  - 4.5.3.3.2 Groundwater
- 4.5.3.4 Biota
  - 4.5.3.4.1 Wetlands
  - 4.5.3.4.2 Aquatic Life
  - 4.5.3.4.3 Wildlife
  - 4.5.3.4.4 Endangered Species
- 4.5.3.5 Historic/Archaeological Resources
- 4.5.3.6 Socioeconomic Resources
- 4.5.3.7 Human Uses
- 4.5.4 Site B
  - (same as above)
  - etc.

#### 4.6 Beneficial Use/Habitat Development

- 4.6.1 General Land Use Setting
- 4.6.2 Description of range of sites considered
- 4.6.3 Site A
  - 4.6.3.1 General Setting and Land Use
  - 4.6.3.2 Soils/Vegetation
  - 4.6.3.3 Water Resources
    - 4.6.3.3.1 Surface
    - 4.6.3.3.2 Groundwater
  - 4.6.3.4 Biota
    - 4.6.3.4.1 Wetlands
    - 4.6.3.4.2 Aquatic Life
    - 4.6.3.4.3 Wildlife
    - 4.6.3.4.4 Endangered Species
  - 4.6.3.5 Historic/Archaeological Resources
  - 4.6.3.6 Socioeconomic Resources
  - 4.6.3.7 Human Uses
- 4.6.4 Site B
  - (same as above)
  - etc.

### **5.0 Environmental Consequences (See Task #5)**

#### 5.1 Open Water Alternatives

- 5.1.1 General Impacts of Open Water Disposal
  - 5.1.1.1 Disposal Process in Open Water
  - 5.1.1.2 Water Column Impacts
  - 5.1.1.3 Sediment Changes

- 5.1.1.4 Burial of benthic epi- and infaunal invertebrates and fish
- 5.1.1.5 Effects of suspended solids on filter-feeders invertebrates, lobster and fish
- 5.1.1.6 Effects on fish and lobster (all life stages)
- 5.1.1.7 Effects on marine wildlife

## 5.1.2 Impacts at Existing and Alternative Sites

### 5.1.2.1 Site A

- 5.1.2.1.1 Water Quality
- 5.1.2.1.2 Sediment Impacts
- 5.1.2.1.3 Benthos
- 5.1.2.1.4 Impacts to Fish/Lobster
- 5.1.2.1.5 Impacts to Wildlife
- 5.1.2.1.6 Impacts to Endangered Species
- 5.1.2.1.7 Socioeconomic Resources
  - 5.1.2.1.7.1 Fishing Activities
  - 5.1.2.1.7.2 Shipping, commercial and recreational navigation
  - 5.1.2.1.7.3 Beaches and Swimming
  - 5.1.2.1.7.4 Parks/Natural Areas
  - 5.1.2.1.7.5 Historic/Archaeological Resources
  - 5.1.2.1.7.6 Other Human Uses(recreational diving, cable/pipeline locations, military activities, mining activities)

### 5.1.2.2 Site B

(same as above)  
etc.

## 5.2 Upland Disposal

### 5.2.1 General Impacts of Upland Disposal

- 5.2.1.1 Description of the disposal process
- 5.2.1.2 Description of range of sites considered
- 5.2.1.3 Land Uses
- 5.2.1.4 Soils/Vegetation
- 5.2.1.5 Water Resources
  - 5.2.1.5.1 Surface
  - 5.2.1.5.2 Groundwater
- 5.2.1.6 Biota
  - 5.2.1.6.1 Wetlands
  - 5.2.1.6.2 Aquatic Life
  - 5.2.1.6.3 Wildlife
  - 5.2.1.6.4 Endangered Species
- 5.2.1.7 Historic/Archaeological
- 5.2.1.8 Socioeconomic Resources

#### 5.2.1.9 Human Uses

### 5.2.2 Impacts at Alternative Sites

#### 5.2.2.1 Site A

##### 5.2.2.1.1 General Setting and Land Use

##### 5.2.2.1.2 Soils/Vegetation

##### 5.2.2.1.3 Water Resources

###### 5.2.2.1.3.1 Surface

###### 5.2.2.1.3.2 Groundwater

##### 5.2.2.1.4 Biota

###### 5.2.2.1.4.1 Wetlands

###### 5.2.2.1.4.2 Aquatic Life

###### 5.2.2.1.4.3 Wildlife

###### 5.2.2.1.4.4 Endangered Species

##### 5.2.2.1.5 Historic/Archaeological Resources

##### 5.2.2.1.6 Socioeconomic Resources

##### 5.2.2.1.7 Human Uses

#### 5.2.2.2 Site B

(same as above)

etc.

### 5.3 Beneficial Use/Habitat Development Sites

#### 5.3.1 General Impacts

##### 5.3.1.1 Description of the disposal process

##### 5.3.1.2 Description of range of sites considered

##### 5.3.1.3 Land Use

##### 5.3.1.4 Soils/Vegetation

##### 5.3.1.5 Water Resources

###### 5.3.1.5.1 Surface

###### 5.3.1.5.2 Groundwater

##### 5.3.1.6 Biota

###### 5.3.1.6.1 Wetlands

###### 5.3.1.6.2 Aquatic Life

###### 5.3.1.6.3 Wildlife

###### 5.3.1.6.4 Endangered Species

##### 5.3.1.7 Historic/Archaeological

##### 5.3.1.8 Socioeconomic

##### 5.3.1.9 Human Uses

#### 5.3.2 Site A

##### 5.3.2.1 Impacts on Land Use

##### 5.3.2.2 Soils/Vegetation

##### 5.3.2.3 Water Resources

###### 5.3.2.3.1 Surface

###### 5.3.2.3.2 Groundwater

- 5.3.2.4 Biota
  - 5.3.2.4.1 Wetlands
  - 5.3.2.4.2 Aquatic Life
  - 5.3.2.4.3 Wildlife
  - 5.3.2.4.4 Endangered Species
- 5.3.2.5 Historic/Archaeological Resources
- 5.3.2.6 Socioeconomic Resources
- 5.3.2.7 Human Uses

5.4 Impacts of Treatment Technologies  
(same outline as Section 5.3)

## **6.0 Ranking of Disposal Site Alternatives**

## **7.0 Compliance/Consistency with Environmental Laws, Regulations and Programs**

## **8.0 Site Management/Monitoring Plans for Open Water Sites**

## **9.0 Public Involvement Process**

## **10.0 References**

## **11.0 List of Preparers**

## **12.0 List of Agencies, Organizations and Persons who received copies of the EIS**

## **13.0 Index**

## **14.0 Glossary**

**Fold-out sheet of abbreviations and acronyms**

## **APPENDICES**

Scoping and Workshop Reports

Public Involvement Plan

Dredging Needs

Site Screening Process and Evaluation Factors

Site Management Plan(s) for Selected/Designated Site(s)

Socioeconomics

Sediment chemistry and bioaccumulation/toxicity testing

Physical Oceanography

Biological testing and sampling (Benthic, fisheries)

Historic and Archaeological Resource Investigations

Correspondence

## **ATTACHMENT #2**

The contractor will prepare the following Appendices which contain the detailed results of all field investigations from the existing and alternative disposal sites, including approaches, assumptions, graphics, data tables, references, etc. The contents of these report shall be summarized in the appropriate detail in the "Affected Environment" and "Environmental Consequences" Sections of the EIS. Detailed "general Sound-wide" discussions of each topic below (as described in Tasks # 4 and 5 for each appropriate topic) shall also be included in each of the following Appendices.

- (A) "Sediment/Water Quality Analyses"
- (B) "Physical Oceanography and Meteorology"
- (C) "Biological Resources of Open Water Sites"
- (D) "Upland/Beneficial Use Site Resources"
- (E) "Socio-economic Resources" (includes air and traffic impacts)
- (F) "Historic and Archaeological Resources"
- (G) "Alternatives Analysis"
- (H) "Site Monitoring/Management Plans"
- (I) "Public Participation"
- (J) "Dredging Needs"

### **(A) SEDIMENT/WATER QUALITY ANALYSES**

#### **Affected Environment**

A physical and chemical characterization of the sediments of all sampling areas is to be detailed, based on testing results and analysis from data collection efforts carried out from the Winter of 2000 to the Fall of 2000, as well as available literature. Testing and analysis results for samples taken at other alternative sites chosen through the site screening process will also be characterized. The evaluation of sediments from the sampling areas at each disposal site will include testing results from areas of historic disposal (*HISTORIC*), no history of disposal (*FARFIELD*), recent disposal (*ACTIVE*), and comparison sites (*NO IMPACT*). A detailed discussion of historical data will be provided. This data will be compared to the more recent data to illustrate any historical changes in the sediment characteristics.

The toxicity of dredged material at the existing disposal sites and alternative disposal sites will be evaluated based on bulk sediment chemistry testing, bioassay, and bioaccumulation testing and compared with the sediment chemistry data. The results will be evaluated using the guidance in "Evaluation of Dredged Material Proposed for Ocean Disposal, Testing Manual, 1991, Report Number USEPA-503/B-91/001", and existing information about the aquatic disposal sites. The goal of this evaluation is to conduct ecological and human health impacts on all study areas at the four existing disposal sites and any alternative sites in Long Island Sound to evaluate effects of disposal of dredged material.

A detailed discussion of historical water quality data will be included, as well as the general water quality of LIS. The pollution gradient in LIS will be described in terms of sources/loads of pollutants and flushing rates. The water quality classification of the Sound will be described, including what water quality standards (CT and NY) are being met, or not met and why. Incidences of hypoxia will be described, the current assumptions on the reasons for its occurrence, and any proposals that are under consideration for correction under the National Estuary Program. Trends and gradients of contaminants in the water column will be described.

## **Environmental Consequences**

Historic physical and chemical sediment data will be reviewed to project the quality and quantity of future dredged materials from the waterways in the study area that could be disposed of at the existing sites, or the alternative sites. This information is to be presented in a matrix format. Assume that only the open water site will receive material that meet the testing requirements of the MPRSA and CWA. The availability of alternative sites (discussed in Task 3) will be discussed relative to projects that will not meet the disposal criteria.

Based on site use evaluated in Dredging Needs analysis and estimated capacity (from DAMOS), predict site life expectancy of each site. Compare active mound to reference to provide example of sediment contaminant loading at site. The contractor shall use site data (DAMOS and data collected for the EIS effort) plus other studies on capping in the scientific literature to evaluate past efficacy of capping (for CLIS and NLDS) and the potential of successful capping for WLIS or any alternative confinement (non-dispersive) site evaluated in detail in the EIS. The sediment stability for each confinement site will be also assessed using LTFATE modeling. The contractor shall also hindcast the effects of tidal currents and level of storm required to resuspend and transport sediments from mound. Offsite samples/data and literature to assess whether sediment from the mounds have move offsite. The transport and the short-term/long-term fate of disposed sediments at Cornfield Shoals dispersive site (and any other proposed dispersive sites) shall be evaluated with USGS sediment transport model and other appropriate methods

The contractor shall perform STFATE modeling on a range of example project types to evaluate impacts range of contaminant release and extent and movement of a plume at each site and available dilution relative to the site boundary (depth and current speed being variable factors) and nearby sensitive resources.

In addition to review of existing data and field efforts, water quality effects and available dilution (release of contaminants) during disposal operations will be assessed using the ADDAMS-STFATE model following guidance in the Clean Water Act, and 33 CFR Part

335. Water quality data will be collected, reviewed and presented for such parameters as pathogens, fecal coliform and dissolved oxygen. A risk characterization of the existing and alternative disposal sites will be performed.

## **(B) PHYSICAL OCEANOGRAPHY/METEOROLOGY**

### **Affected Environment**

The Appendix will include a description of the stratification and water mass dynamics relative to the temperature/salinity regime, the large scale tidal currents and seasonal current patterns for non-tidal currents and waves. The contractor shall review the historical oceanographic (Yale Bingham Oceanographic Collection) and more current (NOAA/USGS/Stony Brook) data to characterize the general patterns. LISS model printouts will be used to exhibit patterns. A description is to be included on how the three basins in the Sound are similar and/or different. Flushing rates will be discussed for each basin. A discussion will be included on sediment transport issues relative to erosion/sedimentation processes using existing USGS models/maps, referencing the geological discussions above.

For the four existing disposal sites, data obtained through previous field investigations, and from appropriate DAMOS sponsored studies, will be summarized, with appropriate graphics provided. Side scan sonar data will be presented, as well as current-temperature data sets, and tidal analyses

For open water and nearshore alternative disposal sites, the contractor will conduct tidal analysis to determine if tidal current magnitudes can be calculated for the sites. Site monitoring of sediment transport potential from the alternative sites will be conducted. The appendix will describe the major seasonal weather patterns that affect LIS as they relate to temperature, precipitation and storm activity.

### **Environmental Consequences**

At each open water alternative, the contractor shall forecast and hindcast the effects of wind driven waves tidal currents on the water movement in the water column and at the bottom. This is in relation to the settlement of dredged material at the site and the stability of the mound under storm conditions. The impact of high frequency storms such as northeasters and low frequency high energy storms hurricanes shall be assessed in terms of their frequency and strength. In each case, the contractor shall identify the level of storm required to resuspend and transport a significant amount of sediments from mound from each site. These analyses will provide part of the bases for the assessment of water quality and mound stability described above.

## **(C) BIOLOGICAL RESOURCES OF THE OPEN WATER SITES**

## **(1) BENTHIC ORGANISMS**

### **Affected Environment**

This appendix will discuss the general community types that have been described for LIS in terms of spatial distribution in the three basins and their seasonality. A comprehensive list is to be included of species found in those community types. A description is to be included on how the community types relate to sediment type, and reflect environmental conditions.

### **Environmental Consequences**

The effects of disposal activities on marine organisms (at various trophic levels) will be evaluated based on the results of sediment and benthic community characteristics. Benthic communities (including lobsters) at the existing and alternative disposal sites will be described based on available literature and sampling efforts. Marine benthic sampling will be the basis for evaluating disposal impacts to the marine environment. The results of toxicity testing and body burden analysis will be considered. The distribution of contaminants of concern in tissue of benthic invertebrates will be evaluated. The Corps and EPA will provide the contractor with the list of contaminants of concern.

Impacts to benthic organisms during disposal operations at the various types of disposal sites will be evaluated by considering suspended solids concentrations and effects around the disposal sites. Disposal operations will be considered in evaluating effects. Direct burial effects of disposal and recolonization time will be described based on modelling (direct burial) and the literature (recolonization time). The effect of destruction of benthic organisms due to disposal operations on benthic organism reproduction in Long Island Sound will be described. The potential extent and duration of loss of the benthic community will be compared among the potential aquatic disposal sites.

The contractor shall project site specific impacts to benthos. The contractor shall evaluate the impacts to organisms based on sediment chemistry, toxicity and bioaccumulation data taken at the active mound in comparison with the "no impact" data. This should be related to observed site-specific benthic community and REMOTS data. Observed contaminant levels to benthic organisms shall be assessed in comparison with tissue-residue effect levels from the literature (Corps ERED and EPA Duluth databases). Effects on species abundance and diversity will be assessed at the four existing sites. Impacts at new alternative sites would be projected from data at the existing sites in comparison with benthic data (chemistry, benthos, toxicity and bioaccumulation data) collected at the new site. The discussion should reference general discussions for general impacts probable recolonization scenarios.

## **(2) PLANKTON**

### **Affected Environment**

The EIS will describe the seasonal patterns and distribution of phytoplankton and zooplankton (holoplankton and meroplankton) in LIS. A discussion will be included regarding species dominance patterns and how they relate to environmental conditions (temperature, salinity, light and nutrients). Any incidences of nuisance or toxic blooms in LIS and their impact on resources and uses will be described.

## **Environmental Consequences**

The contractor shall review the effects of suspended solids and released sediment contaminants on phytoplankton and zooplankton species in Long Island Sound. Assume that the suspended solid phase testing and state water quality criteria will be in compliance. Assess the potential for nuisance phytoplanktonalgae blooms as a result of dredged material disposal at each site.

### **(3) FISHERIES**

#### **Affected Environment**

Information will be presented on the historical and current distribution of fisheries resources within Long Island Sound, including Fishers Island Sound, Gardiners Bay, Peconic Bay, Block Island Sound and open ocean waters immediately seaward of Block Island, Rhode Island and Montauk, New York.

A description of LIS's species of fish and shellfish in terms of general spatial and seasonal distribution will be included.

Key references of historical data and site specific field sampling studies will be summarized, stating the objectives of the studies, the time of year the studies were conducted, and relative abundances. This evaluation will include analyses for both juvenile, adult or sublegal fish. Fluctuations in abundances over time are to be described. Trawl assessment programs carried out for the areas noted above will be summarized, with trawl locations shown on figures. Statistical analyses of abundance of the primary species found will be discussed. A description will be provided of the most abundant species present. A comparative catch per unit effort (mean number per tow and mean weight per tow of finfish) will be graphically shown. Seasonal movements of the winter flounder population will be described in the text and illustrated. Spawning and nursery habitats will be characterized describing relative abundances of eggs and larvae. The relationship of sediment types and benthic communities to the habitat of the demersal fish species is to be described. The amount, quality, and types of species characterized as Essential Fisheries Habitat (EFH) are to be evaluated. An economic inventory and a cost benefit analysis will be conducted for fisheries and communities in and surrounding Long Island Sound.

As discussed in Task #4, the contractor will generate a seasonal distribution map for the most common species noting any known spawning, nursery and migration areas utilizing the CTDEP data, NYDEC data, and any other pertinent studies or data sets. The various abundance patterns (catch and biomass) over regions of LIS are to be discussed. The contractor will generate a comprehensive list of species and a life history table with pertinent information such as spawning habitat and time period, food habits, seasonal migratory activities and population status in LIS. The species that are covered under the

Essential Fish Habitat shall be identified and included in the life history table.

Using existing literature from the database, the historic commercial and recreationally harvestable shellfish resources will be described. Annual landings will be illustrated in graphic format. The EIS will describe the distribution of contaminants of concern in tissue of commercially and recreationally available finfish and shellfish species, including lobsters, at and immediately around each active disposal site and for alternative open water disposal sites.

## **Environmental Consequences**

The EIS will discuss direct, indirect, secondary and cumulative impacts on the fishery resources due to disposal operations at the existing disposal sites, and any alternative open water disposal sites. A description of how impacts can be minimized will be described. Key references describing potential effects of disposal operations on the early life history stages of the appropriate species will be summarized. Impacts to fish from temporary loss of the benthic communities will be described, along with impacts due to burial of eggs and larvae, water quality impacts (total suspended solids, TSS), and site specific impacts based on trawl data. Modelling results will be presented that were carried out for predicting TSS concentrations generated by disposal operations.

The contractor shall project fish and lobster impacts in terms of habitat use focusing on the type of species anticipated at each site. Relate changes in sediment grain size, chemistry and benthos to changes in predatory fish and lobster use of the site. Project effects on fish abundance, diversity and age selection at the site (citing results of BRAT analyses). Observed contaminant levels to fish and lobster shall be assessed in comparison with tissue-residue effects levels from the literature (Corps ERED and EPA Duluth databases). The contractor shall evaluate the effects of site use relative to the location of spawning, nursery, feeding and migratory pathways for all life stages. The contractor shall provide an effects determination for all species for which Essential Fish Habitat designation applies.

### **(4) MARINE WILDLIFE**

#### **Affected Environment**

This appendix will describe the non-endangered marine birds, reptiles and mammals found or potentially found in the existing and alternative open water sites in LIS relative to their seasonality and spatial distribution. A comprehensive species list and life history table will be generated for inclusion in the document.

The contractor shall characterize and evaluate the habitat value of any open water disposal sites. Descriptions will include feeding range and preferred prey species.

## **Environmental Consequences**

The contractor shall evaluate the impacts of site use to wildlife resources that use each site in terms of habitat use, focusing on the type of species anticipated at the site. Relate changes in fish and invertebrates that are prey to species that use the site. The contractor shall project effects on species abundance and diversity at the site and include . The contractor shall discuss potential “takings” or other impacts related to site use under the Marine Mammal Protection Act.

## **(5) ENDANGERED AND THREATENED SPECIES**

### **Affected Environment**

The contractor will provide a description of the presence of any federal or state threatened and endangered species, including their preferred habitat. A discussion will be included relative to their distribution, seasonality and current status, based on information provided by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. State endangered or rare species will also be listed based on information provided by the Connecticut and New York Natural Heritage Programs. Life history tables shall be developed and included for any identified species.

### **Environmental Consequences**

For each site, the contractor shall assess the likelihood that federally listed endangered or threatened, or state listed species are present at any time. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service will provide information on which species may be present and when. The State Natural Heritage Programs will provide information on state-listed species. For each site where listed species may be present, based on information from the appropriate federal and state agencies, the contractor shall evaluate the potential direct impacts from disposal activities (e.g. burial or avoidance) on listed species, as well as long and short-term impacts to their habitats and forage species. The contractor shall prepare a Biological Assessment pursuant to Section 7 of the Endangered Species Act for those sites, if any, determined by EPA to be otherwise appropriate for designation. The Biological Assessment does not have to be a separate document, but can be incorporated into the EIS framework.

## **(D) UPLAND/BENEFICIAL USE SITE RESOURCES**

### **(1) LAND USE**

### **Affected Environment**

The contractor will provide a description of land uses surrounding any upland disposal site alternatives or beneficial use sites, including zoning designations. This will be supported by available land use mapping which is to be obtained from regional, state or local planning agencies, with appropriate colored graphics illustrating the various land use types.

## **Environmental Consequences**

The environmental and socio-economic impacts of upland disposal and/or the creation of beneficial use sites on surrounding land uses, zoning, riparian rights, and water access will be presented. Regional, state and local master plans, municipal plans, and zoning documents will be used as appropriate in considering land use effects. Available landfills and brownfields shall be reviewed as potential upland disposal alternatives. Loss of landfill space will be evaluated for any landfill disposal options. The secondary and indirect impacts of port development will be considered for any port development beneficial use options as well.

### **(2) WATER QUALITY**

#### **Affected Environment**

Describe the local surface and ground water resources and the state classifications for each alternative site. In particular, determine whether these resources are important for existing or future public or private water supply or wildlife/fish habitats.

#### **Environmental Consequences**

The contractor shall describe the potential impacts of dredged material disposal on the surface and ground waters of each alternative site. In addition to potential long term leaching of chlorides and sediment contaminants, the contractor shall provide a description of the applicable methodologies for dewatering upland or beneficial use disposal sites will be provided. An evaluation of the characteristics of effluent from dewatering sites that would be discharged into nearby surface waters is to be provided (required by Section 404). A comparison will also be provided of those contaminants of concern for open water disposal to those that could be present in the dewatering site effluent.

### **(3) AQUATIC/WILDLIFE HABITAT RESOURCES**

#### **Affected Environment**

This Appendix will describe narratively and graphically, using GIS mapping, the presence of important or unique upland or wetland habitats/resources that may be affected by the alternative disposal alternatives under consideration.

Vegetated shallows and mudflats, in particular, are considered Special Aquatic Sites under the Clean Water Act, Section 404(b)(1) guidelines. Potential disposal sites will be reviewed for the presence of wetlands, submerged aquatic vegetation (eelgrass beds) or mudflats based on GIS mapping, other resource maps and studies available from the states of CT and NY, private/local interests in CT and NY, and other available information. Existing habitats will be described for all wetland/habitat creation beneficial use disposal sites. Wetlands will be described primarily based on estimation of percent cover by dominant species and area.

The contractor shall characterize and evaluate the aquatic and wildlife habitat value of any alternative upland and shoreline disposal sites. The appendix will present a

discussion of those species most likely to be present and affected by the potential dredged material disposal alternatives. Onsite mammals, invertebrates, fish, shellfish, amphibians, reptiles, and bird species will be considered. Particular attention will be made to intertidal flats, salt marshes and open water areas which provide important feeding, resting and migratory habitats for shorebirds, gulls and terns, wading birds, waterfowl, diving birds and raptors. Descriptions will include feeding depth range and preferred foods for waterfowl. Any colony nesting waterbird sites will be described and illustrated. The methodology used to characterize the wildlife value will be summarized. The components of the sites that influence wildlife habitat value will be evaluated, including the quality of the vegetation and soils on the site, the spatial relationship between vegetation and physical characteristics of the site, and the position of the sites compared to other habitats.

### **Environmental Consequences**

The contractor shall describe the effects of site use on the quality and quantity of habitat and the species that use the site. The effects of habitat displacement and water quality degradation shall be assessed. Any feasible mitigation measures shall be proposed to alleviate the severity of impacts of a particular site. The effects of disposal at alternative sites will be assessed by evaluating the changes to the existing habitats from placement of material, including re-configuration of the site, and re-establishment of aquatic and wildlife populations.

The potential beneficial uses are marsh creation or rehabilitation in nearshore areas, island habitat creation, beach nourishment, and other habitat creation, such as oyster beds, seagrass beds, and tidal flats shall be assessed. Factors to be used in evaluating creation of these habitats include: the value of the existing habitats compared to the habitats to be created; the amount of time required for created habitats to develop desired habitat characteristics; the present condition of the existing habitats vs. the future condition of the habitats to be created; the existing pattern of habitats in the area; and, the historic pattern of habitats in the vicinity.

(1) \_\_\_\_\_

### **(E) SOCIO-ECONOMIC RESOURCES**

For the purpose of this task, the study area of Long Island Sound is defined as follows. The study area extends essentially from Montauk Point, NY west across northern Long Island to the East River, and then east through CT to the southern coast of RI west of Pt. Judith, including Block Island, RI. The study area includes all harbors on Long Island Sound proper in CT and NY. In NY, the study area includes the East River between Manhattan Borough (New York County) and Brooklyn Borough (Kings County), the East River and Long Island Sound shorelines of the Bronx and Queens Counties, and the Long Island Sound shoreline of Westchester, Nassau, and Suffolk Counties. In CT, the study area includes the entire coastline. In addition, the study area includes the Peconic Bay and Gardiners Bay shorelines in NY, the Fishers Island Sound shores of Connecticut and Rhode Island, and the Block Island Sound shores of New York and Block Island. The study area does not include NY Harbor itself, but does include the Corps of Engineers New York District projects for the eastern East River, Flushing Bay, Bronx River, etc. The Connecticut River below the Hartford navigation project is included, as is the Thames River to Norwich, Housatonic River to Derby, etc. All harbors and port or

navigation dependent facilities in this area, whether Federal or not, are included in the study area.

A bibliography of sources used in the development of this task is included in Attachment #4.

## **SUBTASKS**

### **(1) \_\_\_\_\_ Affected Environment**

#### **(1) \_\_\_\_\_**

#### **1. Identify Universe of Navigation Dependent Facilities**

The contractor will identify all facilities that are dependent on navigational access and dredging for continued usage, including: deep-draft shipping terminals; marinas and yacht clubs; boat repair and construction facilities; commercial fishing facilities; and government facilities, including US Coast Guard, US Navy, municipal wharves, and port authorities. It is estimated that this will include at least 600 facilities related to recreational boating, and approximately 125 deep-draft terminals, located in approximately 25 cities and towns in Connecticut and in seven counties in New York. This survey will cover both harbors that have, and those that do not have Federal navigation projects.

The contractor will prepare a list of all facilities, by municipality and harbor. Facilities will be categorized by location and by Standard Industrial Classification (SIC) code. The list will contain mailing address, point of contact, phone number, description of facility.

#### **2. Survey of Facilities**

Conduct a 100% survey of the facilities identified in Task 1. The survey should determine the following:

Facility Use: Collect and tabulate facility use data, such as cargo types and annual volumes, draft needs of vessels, numbers and types of recreational craft, charter craft, fishing & shellfishing boats, catch volumes, etc., using each facility. Develop summary tables of this data by municipality and harbor.

Dredging and Disposal History and Needs: Collect information from facilities on past dredging and disposal activities (including description of activities, quantities of material removed, dredging methods and disposal sites used); expected future dredging quantities; frequency of future dredging; sensitivity of future dredging to disposal costs; and degree to which business is dependent on dredging.

This survey can be conducted primarily using mail questionnaires. However, for those facilities that are likely to represent a large portion of the material to be dredged in each harbor, such as deep-draft terminals or Port Authorities, large marinas, shipyards, public terminals and landings, and for facilities that are judged to be particularly important or sensitive to the analysis, telephone or in-person interviews should be conducted to ensure that the required data is collected. Submit results to EPA/Corps for review.

The data collected in Task 2 should be combined with known historic dredging volumes and projected future dredging at Corps of Engineers Federal Navigation Projects to estimate future dredging needs and disposal quantities for Long Island Sound, as described and included in the “Dredging Needs Assessment” section of this scope. The dredging projections should be made for logical sub-areas as well as the study area as a whole, to facilitate analysis of alternative disposal site locations.

### **3. Estimate Economic Significance of Navigation Dependent Industries**

Collect economic data from Federal, state, and county sources to estimate the economic significance of navigation dependent industries to the regional economies. The analysis should analyze the different categories of navigation dependent activities separately, such as recreational boating, deep-draft navigation, and commercial fishing, and should show the importance of each category to the regional economies. The analysis should be organized using the SIC codes into which the facilities were organized in Task 1. Economic data to be collected should include total sales, total employment, state and local fees and taxes paid, and any other relevant data identified. Judgement should be used to apportion the collected data to the port areas, since the port areas will be only portions of county or state data. Recommended data sources include County Business Patterns and the Census of Manufacturers, both from the US Census Bureau, the New York and Connecticut Departments of Labor and Employment, any other relevant state and local agencies, and any relevant trade organizations. Once primary economic data is collected, an analysis should be made of multiplier effects to determine the total economic impact of navigation dependent activities on the region. The total economic impact should be related to the no-dredging alternative. Multiplier analysis examines the economic impacts of business activities by linking changes in the economic activity of a primary industry with a measure of how the initial change affects other businesses in a particular geographic region. Multiplier effects should be determined using a generally accepted input-output model such as IMPLAN or RIMS II. The results of this economic analysis, with primary and multiplier effects shown separately, should be presented in logical sub-areas as well as for the study area as a whole in order to facilitate analysis of alternative disposal sites.

For the open water sites, a description will be included regarding commercial and recreation species caught, general areas and seasons of fishing activities, practices, catches (trends) and economic value to the region.

#### **(1) Beaches**

The contractor shall provide a description of the public beaches throughout LIS, their location and importance to users and the local economy. A map will be generated of public beaches in CT and NY. A table will be generated reviewing major beaches and summarizing what is known about closures relative to local pollution inputs to the region.

#### **(1) Parks/Natural Areas**

The contractor shall map and tabulate Federal, state and local parks near all shoreline of LIS. A brief description will be included regarding any sensitive resources that occur in the areas shown on the table.

## ***Other Human Uses***

Other human uses include swimming, recreational diving, cable/pipeline locations, military, and mining activities. The contractor shall include a general description of these other uses of LIS. Any important areas are to be shown on a map.

## **Environmental Consequences**

### **4. Relate Economic Activity from Navigation Dependent Industries to Changes in Disposal Cost**

**(1) \_\_\_\_\_**

Develop an economic model to relate the economic impacts to navigation dependent activities caused by changes in disposal costs. The model should relate dollars of economic activity to logical increments of disposal cost. Once final disposal alternatives are determined, an analysis of the economic impacts of each alternative should be conducted using this model. The analysis should project the likely change in economic activity that could reasonably be expected with each alternative, based on the cost of disposal for each alternative. The no action alternative should be analyzed thoroughly. Impacts that should be discussed for the no action alternative should include impacts to commercial fishing activity, impacts to deep-draft navigation, and impacts to recreational boating activity. The discussion of impacts to deep-draft navigation should include impacts to vessel size distribution, potential for collisions between vessels, and potential for oil spills, and potential for shifts to other modes of transport. The discussion of impacts to recreational boating and commercial fishing with the no action alternative should include social, cultural, and quality of life effects on the affected populations.

### **5. Socioeconomic Impacts of Future Use of Alternative Disposal Sites**

The contractor will analyze and discuss the likely social and economic impacts of future use of the alternative disposal sites being examined. Impacts to be addressed could include changes in shoreline property values near sites, impacts to commercial fishing revenues, impacts to recreational boating, impacts to recreational beaches, and any other likely social or economic impacts.

The contractor shall evaluate and discuss potential conflicts of disposal activities on commercial and recreational fishing, aquaculture, and use of fishing gear, in terms of proximity to the site. A discussion will be included regarding seasonal aspects and how seasonal restrictions may minimize such conflicts. The contractor shall perform a human health risk analysis for consumption of fish and lobster at each site using the fish, shellfish and lobster tissue data collected during the field efforts.

Impacts for an upland disposal alternative should include impacts to property values, traffic impacts, and noise impacts. In addition, any quantifiable natural resource impacts, such as fisheries impacts, should be described and evaluated in monetary terms, to the extent possible. The analysis of alternatives should take into account any disproportionate impacts on environmental justice populations, as required by Executive Order 12898, and protecting children from environmental health risks and safety risks, as required by Executive Order 13045.

## **6. Air Quality/Noise/Transportation and Traffic**

Air quality impacts associated with disposal at the alternative sites will be assessed in general terms to assess the gross level of impacts. The existing air quality conditions in the Long Island Sound region will be described. The assessment will address general emissions associated with dredge equipment and trucks. A table will be included that shows emissions associated with dredging equipment and trucks. As this EIS is a planning document, the proposed action is exempt from the Clean Air Act General Conformity Rule.

Background noise levels at the alternative disposal sites will be generally described. The contractor will include a general description of those state and/or local noise standards applicable to dredging and disposal operations. The EIS will include language stating that future dredging and disposal projects will be evaluated on an individual basis regarding noise impacts.

For any upland site disposal alternatives, effects on transportation and traffic are to be assessed. The contractor will determine the additional projected truck trips that could be required from dewatering sites to upland disposal sites. Potential upland disposal sites and dewatering sites will be illustrated, as well as the major roadways that could be used to transport the material.

## **7. Prepare Socio-economic Appendix for EIS**

The contractor will prepare a "Socio-economic Resources" Appendix to the EIS that will include the information and results of Tasks 1 through 5, including detailed narrative, full tables and complete graphics. The Assessment will describe the affected environment, resources affected (include income, employment, recreational fleet, commercial fleet, deep draft fleet, property values, and others), and will identify and describe impacts of disposal alternatives on these resources. Summaries of the Socio-economic Assessment, including representative tables and graphics will be included in the EIS main report in the purpose and need section and in an economic impacts section, and other sections as appropriate.

### **(1) (F) HISTORIC AND ARCHAEOLOGICAL RESOURCES**

**(1)**

Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and implementing regulation 36 CFR 800 (newly revised as of June 17, 1999), requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR 800.1(a)).

### **(1) Affected Environment**

**(1)**

Alternative disposal sites are to be assessed for the potential existence of historic and/or archaeological resources and possible impacts to these resources. Coordination and consultation will be carried out with the Connecticut and New York State Historic Preservation Officers (SHPO's), Tribal Historic Preservation Officer(s) (THPO's), and

other appropriate consulting parties. Background research, and an assessment of known, recorded, and potential historic properties within the study sites would be carried out to identify historic properties. The analysis will include the potential existence for submerged cultural resources in open water and nearshore sites. Archaeological and shipwreck site files and Native sacred sites or areas would be reviewed at the appropriate SHPO/THPO offices, as well as historic documentation and mapping at State and local libraries and other repositories. The results of the assessment, in coordination with the consulting parties, would indicate whether historic, architectural, and archaeological investigations and/or documentation would be required to further identify all historic properties within the study sites. Remote sensing archaeological surveys, intensive archaeological surveys, architectural surveys may be required, in addition to Historic American Engineering Record and Historic American Building Survey Documentation.

**(1) Environmental Consequences**

(1)

(1) Should historic properties be identified, the Corps, in conjunction with all consulting parties, would apply the Section 106 criteria of adverse effects to these properties. If adverse effects are identified, consultation would continue in an effort to resolve the identified adverse effects. Mitigation of any unavoidable impacts will be proposed and coordinated with the respective SHPO's. If impacts to any significant resources cannot be avoided, additional investigations, including the possibility for full data recovery excavations, may be needed. Consultation to resolve adverse effects could result in the preparation of Memorandum of Agreement (MOA). An MOA outlines agreed upon measures that the agency would take to avoid, minimize, or mitigate the adverse effect. In some cases, the consulting parties may agree that no such measures are possible, but that the adverse effects must be accepted in the public interest.

**(1) (G) ALTERNATIVES ANALYSES**

(1)

**(1) (1) Site screening process**

(1)

Describe the site screening process in detail for the open water, upland and beneficial use site categories as discussed at the October 1999 workshops and follow-up task orders. The guidance outlined in Task #3 shall be followed. The description shall include the universe of sites considered, screening criteria and the process for site selection of sites evaluated in detail in the EIS. The reason for eliminating any alternative shall be described in detail and summarized in an alternatives matrix outlining the site selection criteria.

**(2) Treatment Technologies Alternatives**

(1) The contractor shall review the range of treatment technologies available in the New York/Connecticut area. In addition, the contractor shall review of the successes, failures of application of such technologies making an assessment of their usefulness in the short or long term. Alternative technology selection criteria (taking into consideration costs, engineering feasibility, existing infrastructure and environmental/socioeconomic effects) will be developed and applied to screen appropriate technologies in the Long Island Sound region. A matrix will be used to display the results of the screening. A

proposed shorter list of technologies will be assessed in detail.

(1) \_\_\_\_\_

**(H) SITE MONITORING/MANAGEMENT PLANS (SMMP)**

(1) \_\_\_\_\_

For each designated open water site, the contractor shall follow the EPA guidance for developing SMMPs (to be provided by EPA) and Task # 7.

**(I) PUBLIC PARTICIPATION**

(1) \_\_\_\_\_

This appendix shall include all the Public Participation Plan, public scoping and public involvement efforts providing a summary of the process, mailings, meetings and workshops. Any distributed fact sheets, public notices and meeting reports (e.g., scoping and October workshop reports) shall be included. Issues and comments provided at these events shall be summarized in a matrix with reference to the appropriate sections where they are addressed in the EIS. More guidance is provided in Task #1.

(1) \_\_\_\_\_

### **ATTACHMENT #3**

#### **(1) QUESTIONS TO EVALUATE OPEN WATER DISPOSAL SITES**

##### **SITE LOCATION/RESOURCE ISSUES**

(1) Is the disposal site located to avoid or minimize significant adverse effects/conflicts with commercial and recreational fishing activities?

(2) Is the disposal site located to avoid or minimize significant adverse effects on:

- C Finfish and shellfish (including lobster) habitats that are important for spawning, nursery, feeding and migration purposes (including, but not limited to, Essential Fish Habitat)
- C Unique, hard-bottom or complex benthic habitats
- C Federal/state listed endangered or rare species and their habitats and prey
- C Marine wildlife species (birds, sea turtles, marine mammals) and their habitats and prey
- C Designated nature reserves, sanctuaries, or fish havens (artificial reefs)
- C Shoreline habitats (including mudflats, vegetated wetlands and sub-aquatic vegetation)
- C Historical/archaeological resources
- C Aquaculture sites (including managed oyster beds)
- C Beaches, parks, popular diving and other human use areas
- C Navigation (commercial and recreational), shipping and other marine transportation activities
- C Designated submarine cable or pipeline areas, and aids to navigation
- C Designated military practice areas, anchorages, research, or other restricted areas
- C Areas of potential extractable resources (e.g. sand mining for beach nourishment)?

(1) Will the site location cause significant adverse economic impacts (extraordinarily high transport/handling costs) to private (small business) facilities that need dredging?

## **CONTAMINANT ISSUES**

(2) Does the proposed disposal site provide adequate dilution (water depth, currents) to maintain water quality within and around the site?

(5) Given the quality and quantity of projected projects in the future, what is the projected accumulation of sediment contaminants at a site and potential for bioaccumulation of toxic contaminants in the marine ecosystem or humans?

(1) Has past dumping at the existing sites contributed to the progressive accumulation of toxics (metals, organic contaminants) in sediments and the food web (invertebrates, fish, invertebrate/fish-eating wildlife, humans)? Have they exceeded impact or FDA levels?

(2) Is there any evidence that past dumping of dredged sediments contaminated with pathogens at the existing sites has had an adverse effect on the marine ecosystem or man?

(3) Will the disposal of dredged material at a proposed site promote eutrophication in the surrounding ecosystem (due to inadequate dilution or an already existing excess nutrient problem)? Will it cause or contribute to noxious algae blooms?

## **SEDIMENT TRANSPORT ISSUES**

(4) Does the disposal site location, dimensions, bathymetry, currents and fetch provide the conditions for the deposited sediments to form a stable mound within the site boundaries? Is the site particularly vulnerable during storm events?

(10) Has past disposal of dredged material contributed to the movement of dredged material offsite or towards any geographic-limited fishery, environmentally sensitive or human use area?

(11) For each proposed site, what are the fate and effects of the dredged material plume that remain in the water column after a disposal event, in terms of eventual settlement in depositional areas that surround the site?

(1) What are the transport and fate of sediments deposited at any proposed “dispersal” sites in the Sound?

## **SITE MANAGEMENT ISSUES**

(2) Do the disposal site location and conditions allow for adequate monitoring?

(3) Will capping at any of the proposed “containment” sites adequately sequester sediment contaminants to minimize exposure to burrowing or benthic-feeding marine organisms over the long term; i.e., is the cap effective and stable over time (years-decades)?

(4) What are suitable mound heights that would protect against storm-induced

erosion?

(5) Are capping sites stable in areas where active fishing gear (trawls, shellfish dredges) are used?

(6) What are the minimum capping requirements for each site (in terms of, type of material, thickness and percent coverage)?

### **EFFECTS ON BIOTA**

(7) Has past disposal of dredged material contributed to significant progressive changes in species composition or numbers of the benthic, nektonic (including fisheries) or planktonic biota (including a lack of pollution-sensitive forms) at the dump site or surrounding waters?

(8) Will the development and use of a disposal site contribute measurably to the cumulative effects of other activities or stressors (both natural and man made) that degrade benthic habitats or water quality within the Sound?

(9) After disposal ceases, can we expect that the benthic community will re-establish itself to pre-dumping levels, in terms of species diversity, abundance and biomass? How long?

(10) What significant adverse effects to benthic, fish/shellfish and marine wildlife habitats (onsite and offsite) are anticipated within the eventual depositional areas of a proposed "dispersal" site?

(11) Is there any evidence that past dumping has contributed to the development or recruitment of nuisance species?

## **ATTACHMENT #4**

### Economics Bibliography

USACOE, A Dredged Material Management Study for Coastal Maine and New Hampshire, Normandeau Associates, July 1994.

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USACOE, Providence River Maintenance Dredging, Draft Environmental Impact Statement, 1998.

USACOE, Water Resources Support Center, Waterborne Commerce of the United States, Part 1, Waterways & Harbors, Atlantic Coast, 1997 or most current year.

USACOE, Port Series #4, Ports of Southern New England, 1994.

Boating Almanac, Vol. 2, Long Island, CT, RI, Peter A. Geis, publisher, Boating Almanac Co., Severna Park, Maryland, most current year.